

Micra™ VR2 Leadless Pacemaker

Model MC2VR01



- Single chamber
- SureScan™ technology approved for ≤ 3T, including low-field MRI

Product specifications

Physical characteristics

Volume	0.8 cc
Length	25.9 mm
Outer diameter	6.7 mm (20.1 Fr)
Mass	1.75 g
Materials in chronic contact with human tissue ^a	Titanium, titanium nitride, parylene C, PEEK, nitinol, platinum-iridium alloy, and silicone rubber
Steroid	Dexamethasone acetate, ^b < 1.0 mg, MCRD release mechanism
Fixation mechanism	Nitinol FlexFix™ Tines
Battery	Lithium-hybrid CFx silver vanadium oxide
Nominal pacing cathode	2.5 mm ² , Pt sintered, TiN coated
Minimum pacing anode	22 mm ² , TiN coated
Cathode to anode spacing	18 mm

Battery characteristics

Manufacturer	Medtronic Energy and Component Center
Chemistry	Lithium-hybrid CFx silver vanadium oxide
Initial voltage	3.2 V
Mean usable capacity	142 mAh
Estimated time from RRT to EOS	6 months (180 days)

Replacement indicators

Recommended Replacement Time (RRT)	6 months (180 days) before EOS
Elective Replacement Indicator (ERI)	3 months (90 days) after RRT
End of Service (EOS)	≤ 2.5 V on 3 consecutive daily automatic measurements (approximately 3 months [90 days] after ERI)

^a These materials have been successfully tested for the ability to avoid biological incompatibility. The device does not produce an injurious temperature in the surrounding tissue during normal operation.

^b Steroid (International Nonproprietary Name [INN]): Dexamethasone acetate.

Longevity

Projected service life in years

VVIR or VVI Pacing %	Amplitude	Pacing Rate	Impedance	Longevity in years	
				Pulse width 0.24 ms	Pulse width 0.4 ms
0%	1.5 V	60 bpm	500 Ω	19.8	19.8
5%	1.0 V	60 bpm	500 Ω	19.6	19.4
	1.5 V	60 bpm	500 Ω	19.3	19.0
	2.0 V	60 bpm	500 Ω	18.9	18.4
50%	1.0 V	60 bpm	500 Ω	17.4	16.2
	1.5 V	60 bpm	500 Ω	15.3	13.6
	2.0 V	60 bpm	500 Ω	13.2	11.1
100%	1.0 V	60 bpm	500 Ω	15.4	13.6
	1.5 V	60 bpm	500 Ω	12.4	10.2
	2.0 V	60 bpm	500 Ω	9.7	7.4
	2.5 V	60 bpm	500 Ω	7.6	5.7
100%	1.0 V	60 bpm	400 Ω	14.7	12.8
	1.0 V	60 bpm	600 Ω	15.9	14.3
100%	1.5 V	60 bpm	400 Ω	11.5	9.3
	1.5 V	60 bpm	600 Ω	13.2	11.0
100%	1.5 V	70 bpm	500 Ω	11.6	9.3
	1.5 V	100 bpm	500 Ω	9.5	7.4
100%	2.5 V	60 bpm	600 Ω	8.4	6.3
	3.5 V	60 bpm	500 Ω	4.8	3.4
	5.0 V	60 bpm	500 Ω	2.7	1.8

Device parameters

Emergency VVI settings

Parameter	Selectable values
Mode	VVI
Lower Rate	70 bpm
Sensitivity	2.0 mV
Amplitude	5 V
Pulse Width	1 ms
Blank Post VP	240 ms
Blank Post VS	120 ms
Rate Hysteresis	Off

Pacing parameters

Modes, rate, and intervals

Parameter	Selectable values
Mode	VVIR ; VVI; VOO; OVO; Device Off
Lower Rate ^{a,b,c}	30; 35; 40 ... 60 ... 80; 90 ... 170 bpm

^a The corresponding pulse interval can be calculated as follows: pulse interval (ms) = 60,000/Lower Rate.

^b Programmable values for Lower Rate do not include 65 bpm.

^c If an EMI source interferes with the R-wave detection, the device starts pacing at the programmed lower rate in the VVI mode and at the programmed lower rate or sensor rate in the VVIR mode. When measured according to the standard ISO 14708-2, clause 6.1.5, the escape interval is within -10 and 25 ms of the programmed lower rate interval.

RV sensing and pacing parameters

Parameter	Programmable values
RV Amplitude	0.13; 0.25; 0.38; 0.50; 0.63; 0.75; 0.88; 1.00; 1.13; 1.25; 1.38; 1.50 ; 1.63; 1.75; 1.88; 2.00; 2.13; 2.25; 2.38; 2.50; 2.63; 2.75; 2.88; 3.00; 3.13; 3.25; 3.38; 3.50; 3.63; 3.75; 3.88; 4.00; 4.13; 4.25; 4.38; 4.50; 4.63; 4.75; 4.88; 5.00 V
RV Pulse Width	0.09; 0.15; 0.24 ; 0.40; 1.00 ms
Sensitivity	0.45; 0.60; 0.90; 1.50; 2.00 ; 2.80; 4.00; 5.60; 8.00; 11.30 mV ^{b,c}
Acute Phase Remaining	Device Repositioned (112 days) ; Off

^a Carefully evaluate the possibility of increased susceptibility to EMI and oversensing before changing the sensitivity threshold to its minimum (most sensitive) setting. When susceptibility to interference is tested under the conditions specified in ISO 14708-2 clause 27.4 and EN 45502-2-1 clause 27.5.1, the device may sense the interference if the sensitivity threshold is programmed to the minimum value. The device complies with the requirements of 14708-2 clause 27.4 and EN 45502-2-1 clause 27.5.1 when the sensitivity threshold is programmed to 0.6 mV or higher.

^b Patients who require the lowest sensitivity threshold (0.45 mV) should be under medical direction.

RV Capture Management™ parameters

Parameter	Programmable values
RV Capture Management	Adaptive ; Monitor; Off
RV Amplitude Safety Margin	0.25; 0.50 ... 1.50 V

Blanking periods

Parameter	Programmable values
Blank Post VP	150; 160 ... 240 ... 420 ms
Blank Post VS	120 ; 130 ... 350 ms

Rate response pacing parameters

Parameter	Programmable values
Upper Sensor Rate	80; 90 ... 120 ... 170 bpm
ADL Rate	60; 65 ... 95 ... 160 bpm
Rate Profile Optimization	On ; Off
ADL Response	1; 2; 3 ; 4; 5
Exertion Response	1; 2; 3 ; 4; 5
Activity Acceleration	15; 30 ; 60 s
Activity Deceleration	Exercise ; 2.5; 5; 10 min
Exercise test parameters ^a	
Activity Vector	Vector 1; Vector 2; Vector 3
LR Setpoint	0; 1; 2 ... 40; 42 ... 50
ADL Setpoint	5; 6 ... 40; 42 ... 80; 85 ... 100
UR Setpoint	15; 16 ... 40; 42 ... 80; 85 ... 200

^a The following parameters and their programmed values are shown in the Rate Response Additional Parameters window, but they must be adjusted in the Tests - Exercise screen: Activity Vector, LR Setpoint, ADL Setpoint, UR Setpoint. Tap **Tests > Exercise** to access these parameters.

^c If an EMI source interferes with the R-wave detection, the device starts pacing at the programmed lower rate in the VVI mode and at the programmed lower rate or sensor rate in the VVIR mode. When measured according to the standard ISO 14708-2, clause 6.1.5, the escape interval is within -10 and 25 ms of the programmed lower rate interval.

MRI SureScan parameters

Parameter	Programmable values
MRI SureScan	On; Off
MRI Pacing Mode	VOO; OVO
MRI Pacing Rate	60; 70; 75; 80; 90 ... 120 bpm

Additional pacing features

Parameter	Programmable values
Rate Hysteresis ^a	Off ; 30; 40 ... 80 bpm

^a The programmed value for Rate Hysteresis must be lower than the Lower Rate value unless Rate Hysteresis is programmed to Off.

Data collection parameters

Data collection parameters

Parameter	Programmable values
Device Date/Time ^a	(enter current date and time)
Holter Telemetry	Off , 0.5; 1; 2; 4; 8; 16; 24; hr

^a The times and dates stored in data are determined by the Device Date/Time clock.

Test parameters

System test parameters

Parameter	Selectable values
Pacing Threshold Test parameters	
Threshold Test	Capture Management Amplitude – Auto Decrement
Decrement after	2; 3 ... 15 pulses
Mode ^b (RV test)	VVI; VOO
Lower Rate	30; 35 ... 60; 70; 75; 80; 90 ... 170 bpm
Amplitude	0.13; 0.25; 0.38; 0.50; 0.63 ... 5.00 V
Pulse Width	0.09; 0.15; 0.24; 0.40; 1.00 ms
V. Pace Blanking	150; 160 ... 420 ms
Sensing Test parameters	
Mode	VVI; OVO
Lower Rate	30; 35 ... 60; 70; 75; 80; 90 ... 170 bpm
Exercise Test parameters	

Duration	5; 20 min
Activity Vector ^a	Vector 1; Vector 2; Vector 3
LR Setpoint ^a	0; 1; 2 ... 40; 42 ... 50
ADL Setpoint ^a	5; 6 ... 40; 42 ... 80; 85 ... 100
UR Setpoint ^a	15; 16 ... 40; 42 ... 80; 85 ... 200

^a If the permanently programmed pacing mode is VOO, Capture Management is not available for selection.

^b The selectable test values for this parameter depend on the permanently programmed pacing mode.

Temporary test parameters

Temporary test parameters

Parameter	Selectable values
Mode	VVI; VOO; OVO
Lower Rate	30; 35; 40 ... 60; 70; 75; 80; 90 ... 170 bpm
Amplitude	0.13; 0.25; 0.38; 0.50; 0.63 ... 5.00 V
Pulse Width	0.09; 0.15; 0.24; 0.40; 1.00 ms
Sensitivity	0.45; 0.60; 0.90; 1.50; 2.00; 2.80; 4.00; 5.60; 8.00; 11.30 mV

Nonprogrammable parameters

Nonprogrammable parameters

Parameter	Selectable values
Pacing rate limit (runaway pacing rate protection)	195 bpm
Minimum input impedance	150 k Ω
Pacing output capacitance	2.2 μF

Brief Statement

See the device manual for detailed information regarding the instructions for use, the implant procedure, indications, contraindications, warnings, precautions, and potential adverse events. If using an MRI SureScan™ device, see the MRI SureScan™ technical manual before performing an MRI. For further information, contact your local Medtronic representative and/or consult the Medtronic website at medtronic.eu.

For applicable products, consult instructions for use on www.medtronic.com/manuals. Manuals can be viewed using a current version of any major internet browser. For best results, use Adobe Acrobat®* Reader with the browser.

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